

CLAIMS

1. A method for receiving three-dimensional (3D) video,
the method comprising:

accepting a bitstream with a current video frame encoded
5 with two interlaced fields;
decoding a current frame top field;
decoding a current frame bottom field; and,
presenting the decoded top and bottom fields as a 3D frame
image.

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2. The method of claim 1 wherein accepting a bitstream
with a current video frame encoded with two interlaced fields includes
accepting the bitstream in a standard selected from the group including
Motion Pictures Expert Group-2 (MPEG2), MPEG4, and ITU-T H.264
15 standards.

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3. The method of claim 1 wherein presenting the decoded
top and bottom fields as a 3D frame image includes presenting the
decoded top and bottom fields as a stereo-view image.

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4. The method of claim 1 further comprising:
receiving a supplemental enhancement information (SEI) 3D
content message with the current video frame;
analyzing display capabilities;
25 if non-3D display capabilities are detected, decoding only one
of the current frame interlaced fields; and,

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presenting a two-dimensional (2D) frame image.

5. The method of claim 1 further comprising:

analyzing display capabilities;

5 if non-3D display capabilities are detected, decoding only one
of the current frame interlaced fields; and,

presenting a 2D frame image.

6. The method of claim 1 further comprising:

10 accepting 2D selection commands;

decoding only one of the current frame interlaced fields in
response to the 2D selection commands; and,

presenting a 2D frame image.

15 7. The method of claim 6 wherein accepting 2D selection
commands includes accepting 2D selection commands in response to a
trigger selected from the group including receiving an SEI message, an
analysis of display capabilities, manual selection, and receiver system
configuration.

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8. The method of claim 1 further comprising:

presenting a 2D frame image in response to using only one of
the decoded current frame interlaced fields.

25 9. The method of claim 1 further comprising:

prior to accepting the current frame, accepting a first
encoded video frame;

deriving a predictive first frame top field;

deriving a predictive first frame bottom field;

5 wherein decoding the current frame top field includes
decoding the current frame top field in response to the predictive first
frame top field; and,

 wherein decoding a current frame bottom field includes
decoding the current frame bottom field in response to the predictive first
10 frame bottom field.

10. The method of claim 1 further comprising:

prior to accepting the current frame, accepting a first
encoded video frame;

15 deriving a predictive first frame first field;

 wherein decoding the current frame top field includes
decoding the current frame top field in response to the predictive first
frame first field; and,

 wherein decoding the current frame bottom field includes
20 decoding the current frame bottom field in response to the predictive first
frame first field.

11. The method of claim 10 wherein deriving a predictive
first frame first field includes deriving a predictive first frame top field.

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12. The method of claim 10 wherein deriving a predictive first frame first field includes deriving a predictive first frame bottom field.

5 13. The method of claim 1 further comprising:
simultaneous with the presentation of the 3D image,
presenting a 2D image in response to using one of the decoded current
frame interlaced fields.

10 14. A method for encoding three-dimensional (3D) video,
the method comprising:
accepting a current 3D video image, including a first view of
the image and a second, 3D, view of the image;
encoding the first view as a frame top field;
15 encoding the second view as the frame bottom field; and,
transmitting a bitstream with a current video frame, having
the top field interlaced with the bottom field, into a channel.

15 15. The method of claim 14 wherein transmitting the
bitstream with the current video frame having the top field interlaced
with the bottom field includes transmitting the bitstream in a standard
selected from the group including Motion Pictures Expert Group-2
(MPEG2), MPEG4, and ITU-T H.264 standards.

16. The method of claim 14 wherein accepting a current 3D video image, including a first view of the image and a second, 3D, view of the image includes accepting a first and second view of a stereo image.

5 17. The method of claim 14 further comprising:
transmitting a supplemental enhancement information (SEI) 3D option message with the current video frame to trigger optional single field two-dimensional (2D) decoding.

10 18. The method of claim 14 further comprising:
accepting a 2D command responsive to a trigger selected from the group including an analysis of receiver capabilities and the channel bandwidth; and,
transmitting the 2D command to a receiver.

15 19. The method of claim 18 further comprising:
transmitting only one of the fields from the current view frame.

20 20. The method of claim 14 further comprising:
prior to accepting the current video image, accepting a first video image;
encoding a first image top field;
encoding a first image bottom field;

wherein encoding the current frame top field includes
encoding the current frame top field in response to the first image top
field; and,

wherein encoding the current frame bottom field includes
5 encoding the current frame bottom field in response to the first frame
bottom field.

21. The method of claim 14 further comprising:
prior to accepting the current image, accepting a first video
10 image;

encoding a first image first field;

wherein encoding the current frame top field includes
encoding the current frame top field in response to the first image first
field; and,

15 wherein encoding the current frame bottom field includes
encoding the current frame bottom field in response to the first image first
field.

22. The method of claim 21 wherein encoding a first image
20 first field includes encoding a first image top field.

23. The method of claim 21 wherein encoding a first image
first field includes encoding a first image bottom field.

24. A three-dimensional (3D) video receiver system, the
25 system comprising:

a decoder having an input connected to a channel to accept a bitstream with a current video frame encoded with two interlaced fields and an output to supply a decoded current frame top field and current frame bottom field; and,

5 a display having an input to accept the decoded fields, the display visually presenting the decoded top and bottom fields as a 3D frame image.

25. The system of claim 24 wherein the decoder accepts
10 the bitstream in a standard selected from the group including Motion Pictures Expert Group-2 (MPEG2), MPEG4, and ITU-T H.264 standards.

26. The system of claim 24 wherein the display visually presents the decoded top and bottom fields as a stereo-view image.

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27. The system of claim 24 wherein the decoder receives a supplemental enhancement information (SEI) 3D content message with the current video frame, analyzes display capabilities, and, if non-3D display capabilities are detected, decodes only one of the current frame
20 interlaced fields in response to the 3D option SEI message; and,
wherein the display visually presents a two-dimensional (2D) image.

28. The system of claim 24 wherein the decoder analyzes
25 the display capabilities and decodes only one of the current frame interlaced fields, if non-3D display capabilities are detected; and,

wherein the display visually presents a 2D image.

29. The system of claim 24 wherein the decoder includes a 2D decision unit to supply 2D selection commands, and wherein the
5 decoder decodes only one of the current frame interlaced fields in response to the 2D selection commands; and,
wherein the display visually presents a 2D image.

30. The system of claim 29 wherein the decoder 2D
10 decision units supplies 2D selection commands in response to a trigger selected from the group including receiving an SEI message, an analysis of display capabilities, manual selection, and receiver system configuration.

15 31. The system of claim 24 further comprising:
wherein the display visually presents a 2D image in response to using only one of the decoded current frame interlaced fields.

32. The system of claim 24 wherein the decoder, prior to
20 accepting the current frame, accepts a first encoded video frame, derives a predictive first frame top field, derives a predictive first frame bottom field, decodes the current frame top field in response to the predictive first frame top field, and decodes the current frame bottom field in response to the predictive first frame bottom field.

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33. The system of claim 24 wherein the decoder, prior to accepting the current frame, accepts a first encoded video frame, derives a predictive first frame first field, decodes the current frame top field in response to the predictive first frame first field, and decodes the current
5 frame bottom field in response to the predictive first frame first field.

34. The system of claim 33 wherein the decoder derives a predictive first frame top field.

10 35. The system of claim 33 wherein the decoder derives a predictive first frame bottom field.

36. The system of claim 24 wherein the display, as a selected alternative to the presentation of the 3D image, presents a 2D
15 image in response to using only one of the decoded current frame interlaced fields.

37. A three-dimensional (3D) video encoding system, the system comprising:
20 an encoder having an input to accept a current 3D video image, including a first view of the image and a second, 3D, view of the image, the encoder encoding the first view as a frame top field and the second view as the frame bottom field, and the encoder having a channel-connected output to supply a bitstream with current video frame, having
25 the top field interlaced with the bottom field.

38. The system of claim 37 wherein the encoder transmits the bitstream in a standard selected from the group including Motion Pictures Expert Group-2 (MPEG2), MPEG4, and ITU-T H.264 standards.

5 39. The system of claim 37 wherein the encoder accepts a first and second view of a stereo image.

40. The system of claim 37 wherein the encoder transmits a supplemental enhancement information (SEI) 3D option message with
10 the current video frame, to trigger optional single field two-dimensional (2D) decoding.

41. The system of claim 37 wherein the encoder transmits a 2D command responsive to a trigger selected from the group including
15 an analysis of connected receiver capabilities and the channel bandwidth.

42. The system of claim 41 wherein the encoder encodes and transmits only one of the fields from the current view frame.

20 43. The system of claim 37 wherein the encoder, prior to accepting the current video image, accepts a first video image, encodes a first image top field, encodes a first image bottom field, encodes the current frame top field in response to the first image top field, and encodes the current frame bottom field in response to the first frame bottom field.

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44. The system of claim 37 wherein the encoder, prior to accepting the current image, accepts a first video image, encodes a first image first field, encodes the current frame top field in response to the first image first field, and encodes the current frame bottom field in response to the first image first field.

45. The system of claim 44 wherein the first image first field is a first image top field.

46. The system of claim 44 wherein the first image first field is a first image bottom field.

47. A three-dimensional (3D) video decoder, the decoder comprising:
an input connected to a channel to accept a bitstream with a current video frame encoded with two interlaced fields and an output to supply a decoded current frame top field and current frame bottom field.